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START

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 604151

Proj. ECN

2. ECN Category (mark one) Supplemental [] Direct Revision [x] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	3. Originator's Name, Organization, MSIN, and Telephone No. J. G. Adler, 88210, H6-23, 376-7513		4. Date 11/18/94
	5. Project Title/No./Work Order No. 304 Concretion Facility	6. Bldg./Sys./Fac. No. 304 Concretion Facility	7. Approval Designator E
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[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	n/a	n/a Cog. Engineer Signature & Date	n/a Cog. Engineer Signature & Date

12. Description of Change

Revision of SD to correct typographical errors and to incorporate comments from the Washington State Department of Ecology

13a. Justification (mark one)	Criteria Change []	Design Improvement []	Environmental []
As-Found []	Facilitate Const. []	Const. Error/Omission []	Design Error/Omission []

13b. Justification Details

14. Distribution (include name, MSIN, and no. of copies) *ADVANCE COPY

*J. G. Adler	H6-23 (1)
F. A. Ruck	H6-23 (1)
J. L. Wright	H6-23 (1)
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CENTRAL FILES	L8-04

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DATE NOV 22 1994
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ENGINEERING CHANGE NOTICE

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604151

15. Design Verification Required	16. Cost Impact				17. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog. Eng. J. G. Adler *J G Adler*	11/21/94	PE	
Cog. Mgr. F. A. Ruck III *FA Ruck III*	11/21/94	QA	
QA		Safety	
Safety		Design	
Environ. F. A. Ruck III *FA Ruck III*	11/21/94	Environ.	
Other		Other	
J. L. Wright *J L Wright via phone*	11/21/94		
I. L. Metcalf *I. L. Metcalf via phone*	11/19/94		
K. J. Young *KJ Young via phone*	11/22/94	DEPARTMENT OF ENERGY	
M. S. Hendrix *M.S. Hendrix*	11/22/94	Signature or a Control Number that tracks the Approval Signature	
		ADDITIONAL	

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SUPPORTING DOCUMENT

1. Total Pages 32

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6. Author

Name: J. G. Adler

J G Adler 11/17/94

Signature

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TCPN: K345C

7. Abstract

This is the sample and analysis plan for the closure activities at the 304 Concretion Facility. This document supports the *304 Concretion Facility Closure Plan*, DOE/RL-90-03. The sampling and analysis plan identifies the sample locations, any special handling requirements, quality control samples, required chemical analysis, and data validation need to meet the requirements of the *304 Concretion Facility Closure Plan*.

8. RELEASE STAMP

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RECORD OF REVISION

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Page 1

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PHASE I SAMPLING AND ANALYSIS PLAN FOR THE 304 CONCRETION FACILITY CLOSURE ACTIVITIES

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release (5) Cog. Engr.	(6) Cog. Mgr. Date
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WHC-SD-EN-AP-177
Revision 1

Phase I Sampling and Analysis Plan for the 304 Concretion Facility Closure Activities

Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management

Westinghouse
Hanford Company Richland, Washington

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

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RELEASE AUTHORIZATION

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This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

V. L. Birkland   11/21/93

V.L. Birkland

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PHASE I SAMPLING AND ANALYSIS PLAN FOR THE 304 CONCRETION FACILITY CLOSURE ACTIVITIES

1.0 PURPOSE

This document describes the initial (Phase I) sampling and analysis activities associated with the proposed clean closure of the 304 Concretion Facility under the *Washington Administrative Code* (WAC) 173-303-610, "Dangerous Waste Regulations". This is a supplement to *304 Concretion Facility Closure Plan* (DOE-RL 1993a), and should be used in conjunction with the *Environmental Investigations and Site Characterization Manual* (WHC 1988) for specific procedures.

The strategy for clean closure of the 304 Concretion Facility is to decontaminate, sample (Phase I sampling), and evaluate results. If the evaluation indicates that a limited area requires additional decontamination for clean closure, the limited area will be decontaminated, resampled (Phase II sampling), and the result evaluated. If the evaluation indicates that the constituents of concern are below action levels, the facility will be clean closed. Or, if the evaluation indicates that the constituents of concern are present above action levels, the condition of the facility will be evaluated and appropriate action taken.

The action levels are defined as the concentrations of dangerous waste constituents above the Hanford Site background concentrations identified in *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes* (DOE-RL 1993b) and above the residential concentrations identified in *Model Toxics Control Act* [WAC 173-340] residential levels.

The criteria used to develop the sample locations, analytical methods, quality control methodology, and data validation methodology were based on the contents of Revision 2 of the *304 Concretion Facility Closure Plan* (DOE-RL 1993a) and further developed during the Data Quality Objectives Meetings held on May 30, June 1, and August 25, 1994, and in the monthly Unit Manager Meetings held during 1994.

2.0 OBJECTIVE

The objective is to facilitate a RCRA clean closure of the site by verifying that decontamination has reduced the concentrations of all constituents of concern to below action levels. This objective will be met by collecting samples from 37 locations. The samples will then be analyzed to determine the levels of the constituents of concern.

3.0 SITE DESCRIPTION/BACKGROUND

The 304 Concretion Facility is located in the northwest corner of the 300 Area. The layout of the facility is shown in Figures 1 and 2. The facility consists of a building, an associated changeroom, and an external storage area. The building is a steel framed building with sheet metal sides and a poured concrete floor. There is no interior insulation or wallboard. The ceiling of the facility consists of exposed steel trusses (girders). The floor area has a drainage trench, a floor drain, and a sump area. The changeroom is metal with a concrete floor and the interior walls and ceiling are covered with wallboard and insulated. The storage area consists of a concrete pad surrounded by asphalt. The building is also surrounded by an asphalt strip.

The 304 Concretion Facility has performed a variety of functions. From construction in 1952 until the mid-1960's, the facility housed the pilot plants associated with cladding uranium cores. From the mid-1960's until 1971, the facility was used to store engineering equipment and product chemicals. From 1972 until 1994, the facility was used to treat low-level radioactive mixed waste, recyclable scrap uranium generated during nuclear fuel fabrication processes or development activities, and uranium-titanium alloy chips and fines. Also, the facility was used for the repackaging of spent halogenated solvents from the nuclear fuels manufacturing process.

4.0 SCOPE OF WORK

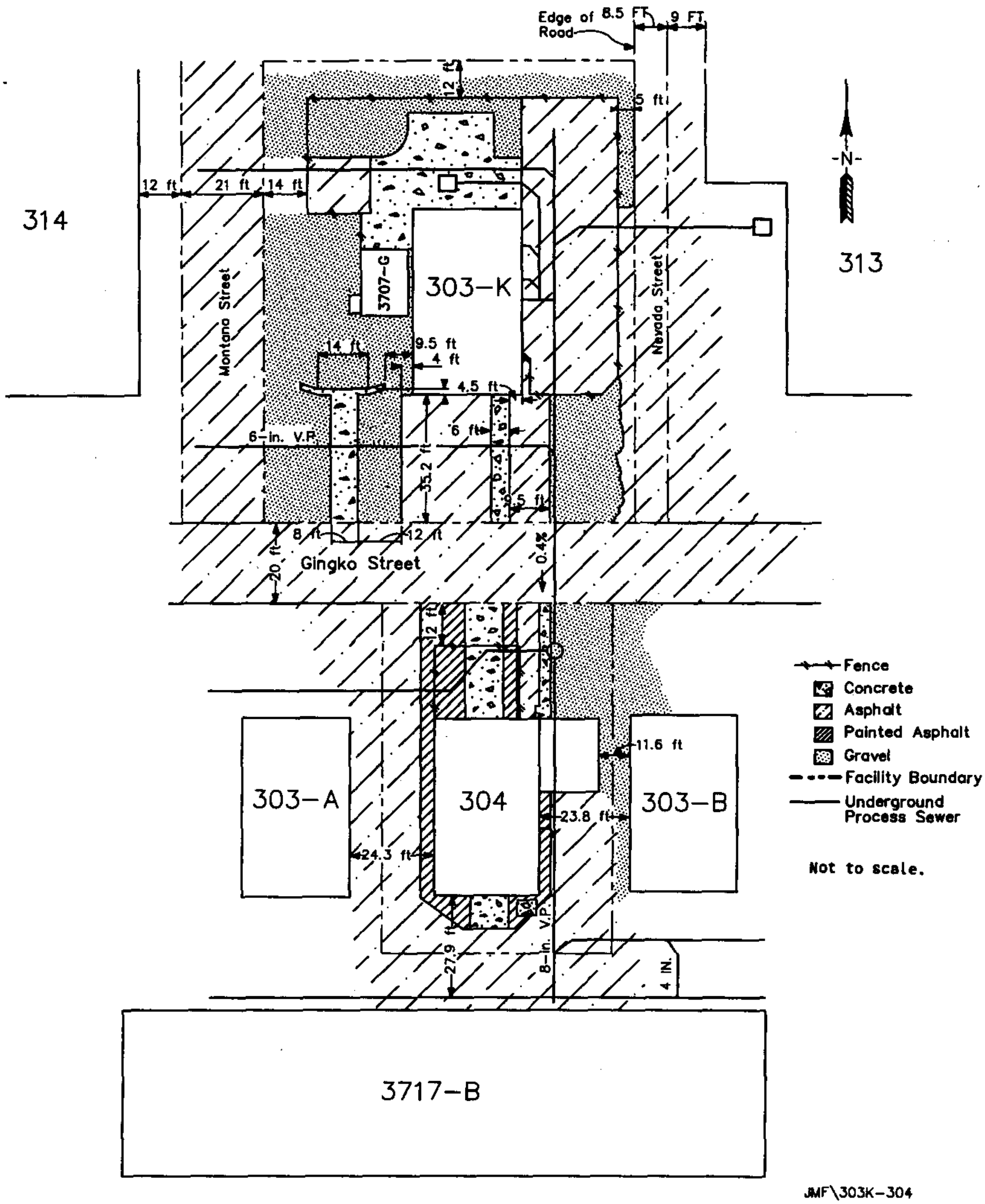
There are a total of 37 sampling locations comprising 12 concrete core, 1 concrete chip, 9 soil, 11 wipe, and 4 asphalt core sampling locations. For the 9 soil sampling locations, samples will be collected at the 0 to 6-inch, 6 to 18-inch, and 18 to 24-inch intervals. Table 1 presents a summary of the 304 Facility sampling.

Analysis for inorganics and volatile organics will be performed on the concrete core and soil samples. Separate concrete core samples will be required for the inorganic and volatile organic analysis (VOA). Analysis for inorganics only will be performed on the concrete chip, wipe, and asphalt samples.

5.0 SAMPLING AND FIELD ACTIVITIES

This section discusses the Phase I sampling of the 304 Concretion Facility. Table 1 presents a summary of the sample types and locations.

1 Figure 1. Plan View of 304 Concretion Facility Surrounding Area.



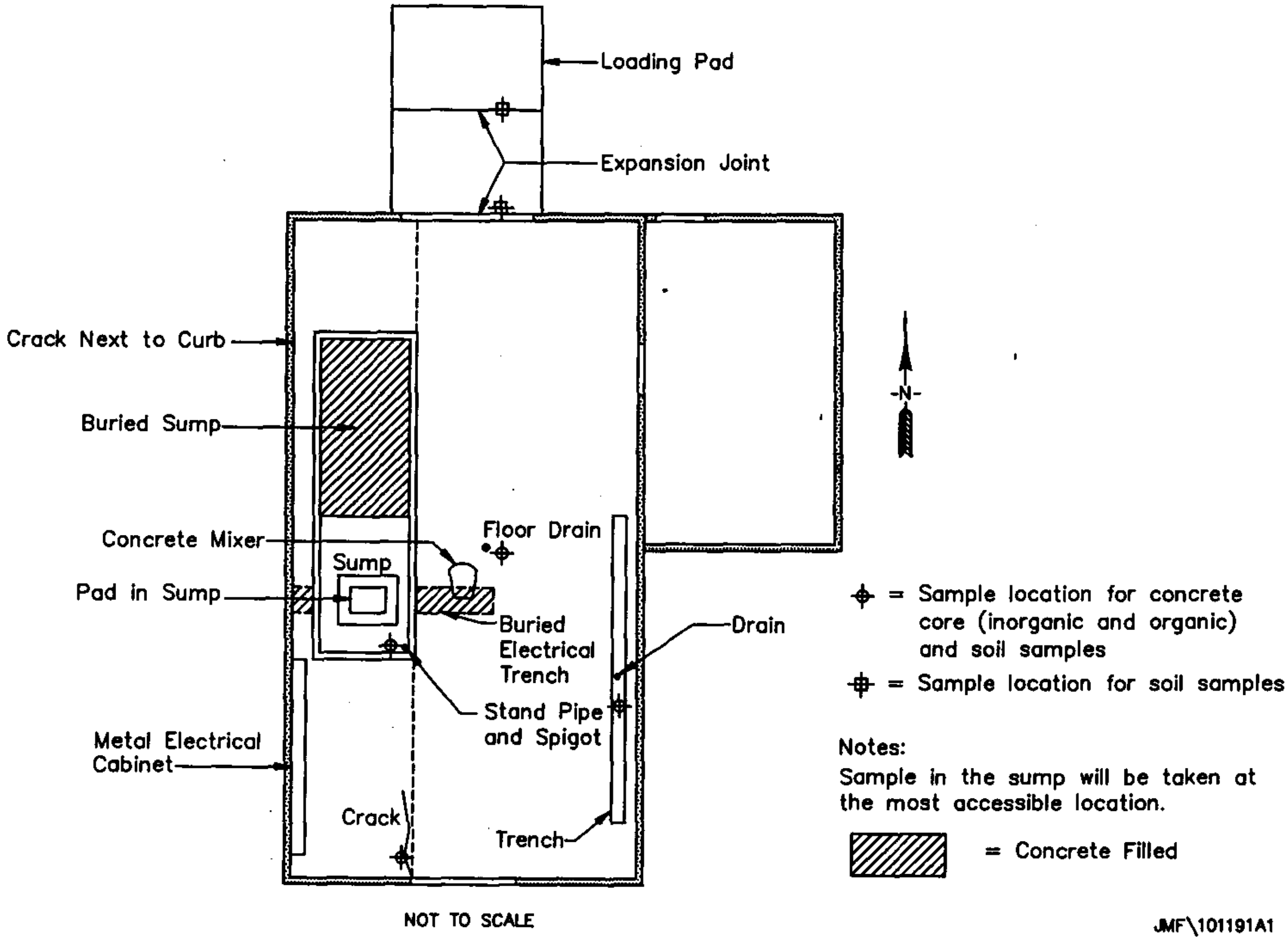


Figure 2. 304 Concretion Facility, Authoritative Concrete Core and Soil Sample Locations in Areas of Potential Contamination.

Table 1. Summary of 304 Concretion Facility Sampling.

Number of sample locations	Sample types	Inorganic sample	Organic sample	Total number of samples
	FLOOR			
4	Authoritative Concrete Core	1	1	8
6	Random Concrete Core	1	0	6
1	Random Concrete Core	1	1	2
4	Soil, 0 to 6 inches	1	1	8
	6 to 18 inches	1	1	8
	18 to 24 inches	1	1	8
(Note: Soil samples and Authoritative Concrete Core Samples are co-located.)				
	STORAGE PAD			
1	Random Asphalt Core	1	0	1
1	Random Concrete Core	1	1	2
2	Soil, 0 to 6 inches	1	1	4
	6 to 18 inches	1	1	4
	18 to 24 inches	1	1	4
	CHANGEROOM FLOOR			
1	Random Concrete Chip	1	0	1
	NORTH WALL			
2	Random Wipe	1	0	2
	SOUTH WALL			
2	Random Wipe	1	0	2
	EAST WALL			
3	Random Wipe	1	0	3
	WEST WALL			
3	Random Wipe	1	0	3
	GIRDER			
1	Wipe	1	0	1
	WEST-SIDE, BUILDING EXTERIOR			
2	Asphalt Core	1	0	2
2	Soil, 0 to 6 inches	1	1	4
	6 to 18 inches	1	1	4
	18 to 24 inches	1	1	4
(Note: Soil samples and Asphalt Core Samples are co-located.)				
	EAST-SIDE, BUILDING EXTERIOR			
1	Asphalt Core	1	0	1
1	Soil, 0 to 6 inches	1	1	2
	6 to 18 inches	1	1	2
	18 to 24 inches	1	1	2
(Note: Soil samples and Asphalt Core Samples are co-located.)				

5.1 GENERAL PROCEDURES

The activities associated with implementing this SAP will be conducted in accordance with the following environmental investigations instruction (EII) procedures (WHC 1988):

- EII 1.1, Hazardous Waste Site Entry Requirements
- EII 1.5, Field Logbooks
- EII 1.13, Environmental Readiness Review
- EII 5.1, Chain of Custody
- EII 5.2, Soil and Sediment Sampling
- EII 5.4, Field Cleaning and/or Decontamination of Equipment
- EII 5.5, 1706 KE Laboratory Decontamination of RCRA/*Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Sampling Equipment
- EII 5.10, Obtaining Sample Identification Numbers and Accessing Hanford Environmental Information System Data
- EII 5.11, Sample Packaging and Shipping
- EII 14.1, Analytical Laboratory Data Management.

5.1.1 Total Activity Samples

In addition to the samples listed in Sections 5.2 to 5.6, total activity samples are needed to determine radiological dose rates that control the transportation and handling requirements for the samples. Total activity samples will be collected as determined by the Sampling Field Team Leader as needed to support sampling transportation and handling. If a total activity sample is required for a VOA sample, the original VOA sample will not be used and a separate sample will be collected for total activity analysis.

5.1.2 Figures

Figures 3 through 9 identify the sampling locations at the 304 Concretion Facility. Sampling methodology and selection of the sampling locations is discussed in the *304 Concretion Facility Closure Plan* (DOE-RL 1993a). Each sampling area (wall or floor) was divided by a 1 meter by 1 meter grid. Random sampling grid locations were then selected from within each area.

Figure 3. 304 Concretion Facility, Building Floor Concrete Core Sampling Locations.

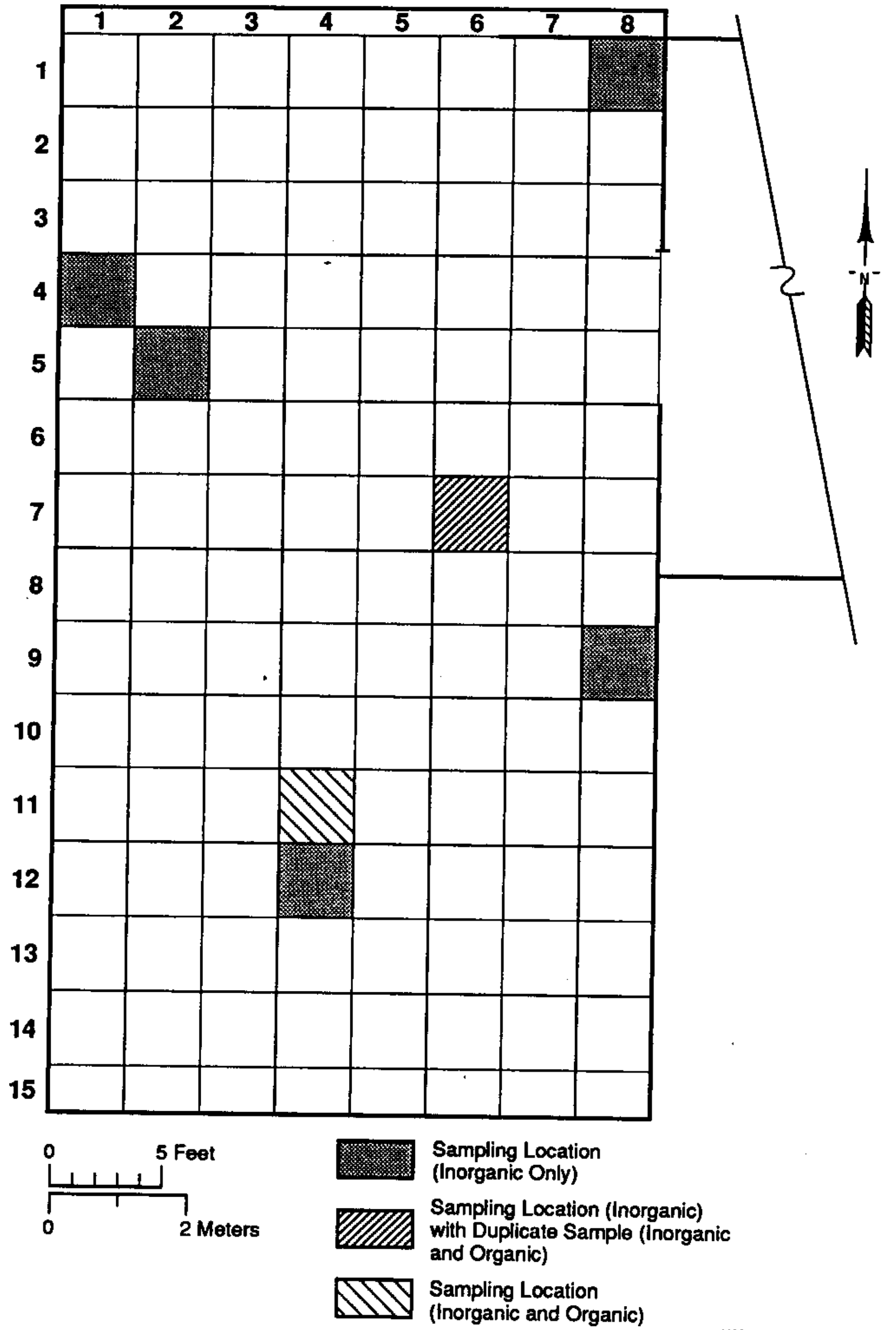


Figure 4. 304 Concretion Facility, Outside Storage Pad Concrete and Asphalt Core Sampling Locations.

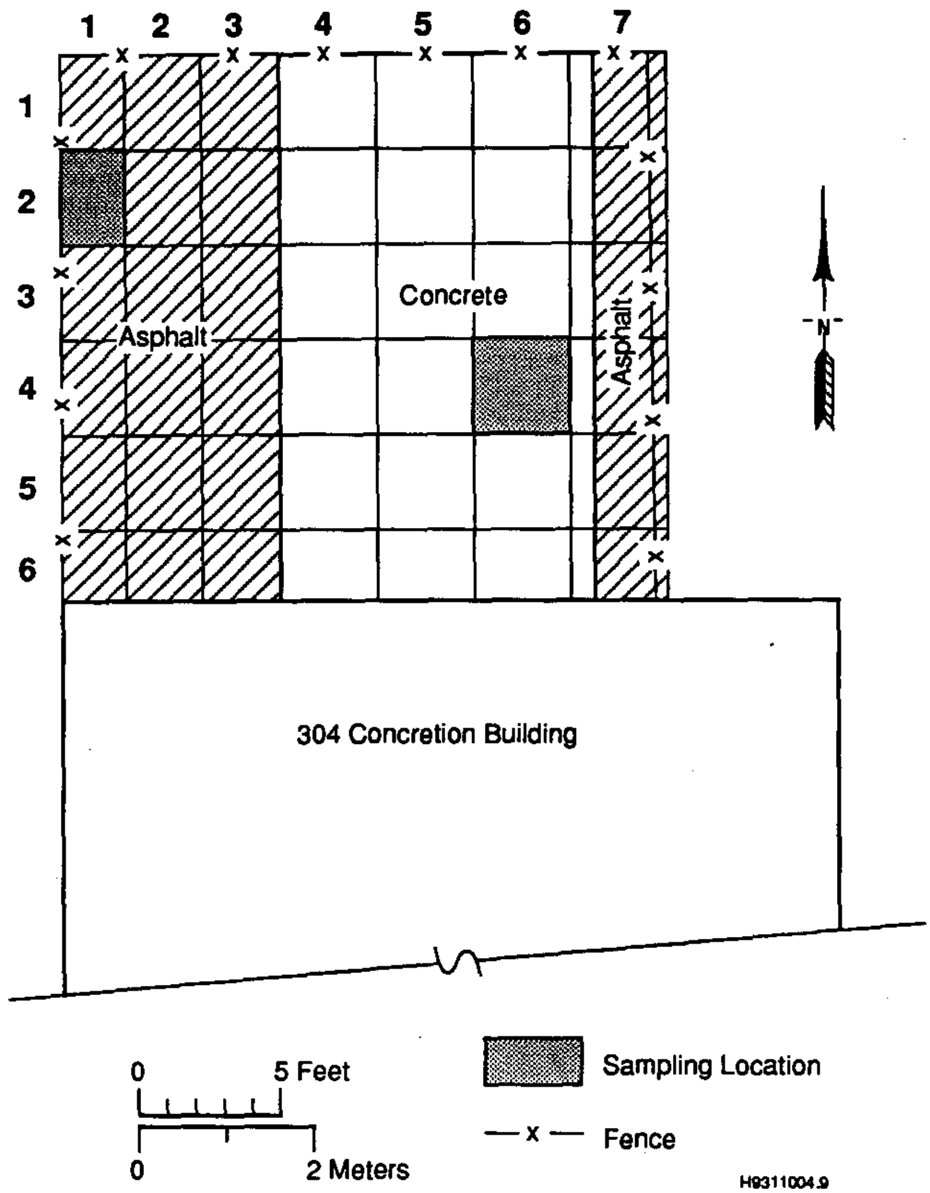


Figure 5. 304 Concretion Facility, Changeroom Floor Concrete Chip Sample Location.

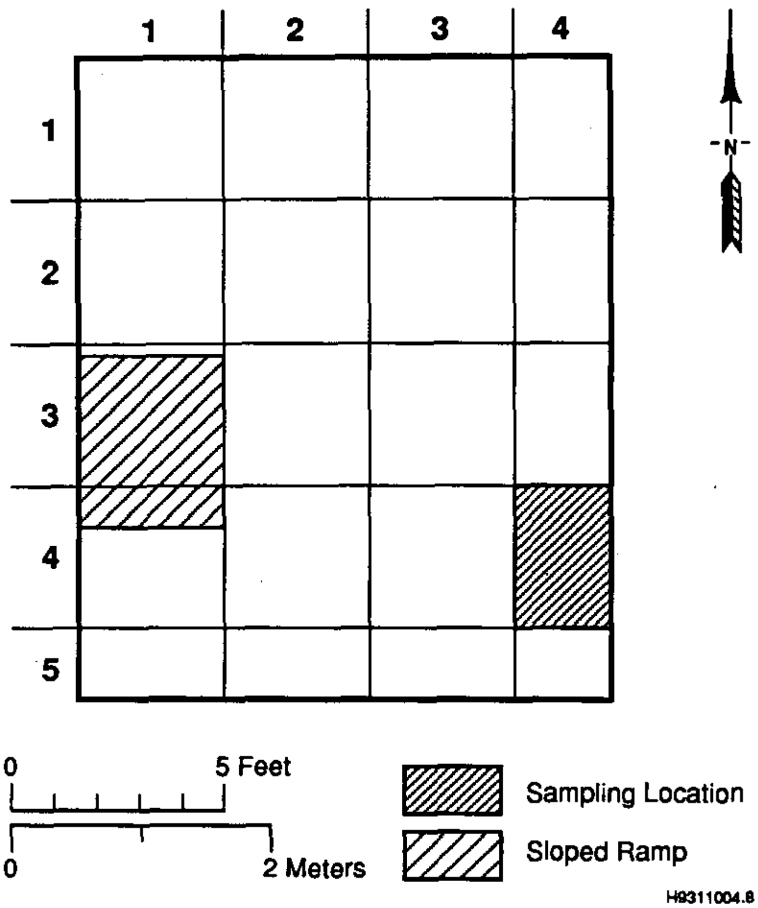


Figure 6. 304 Concretion Facility, North Wall Wipe Sample Locations.

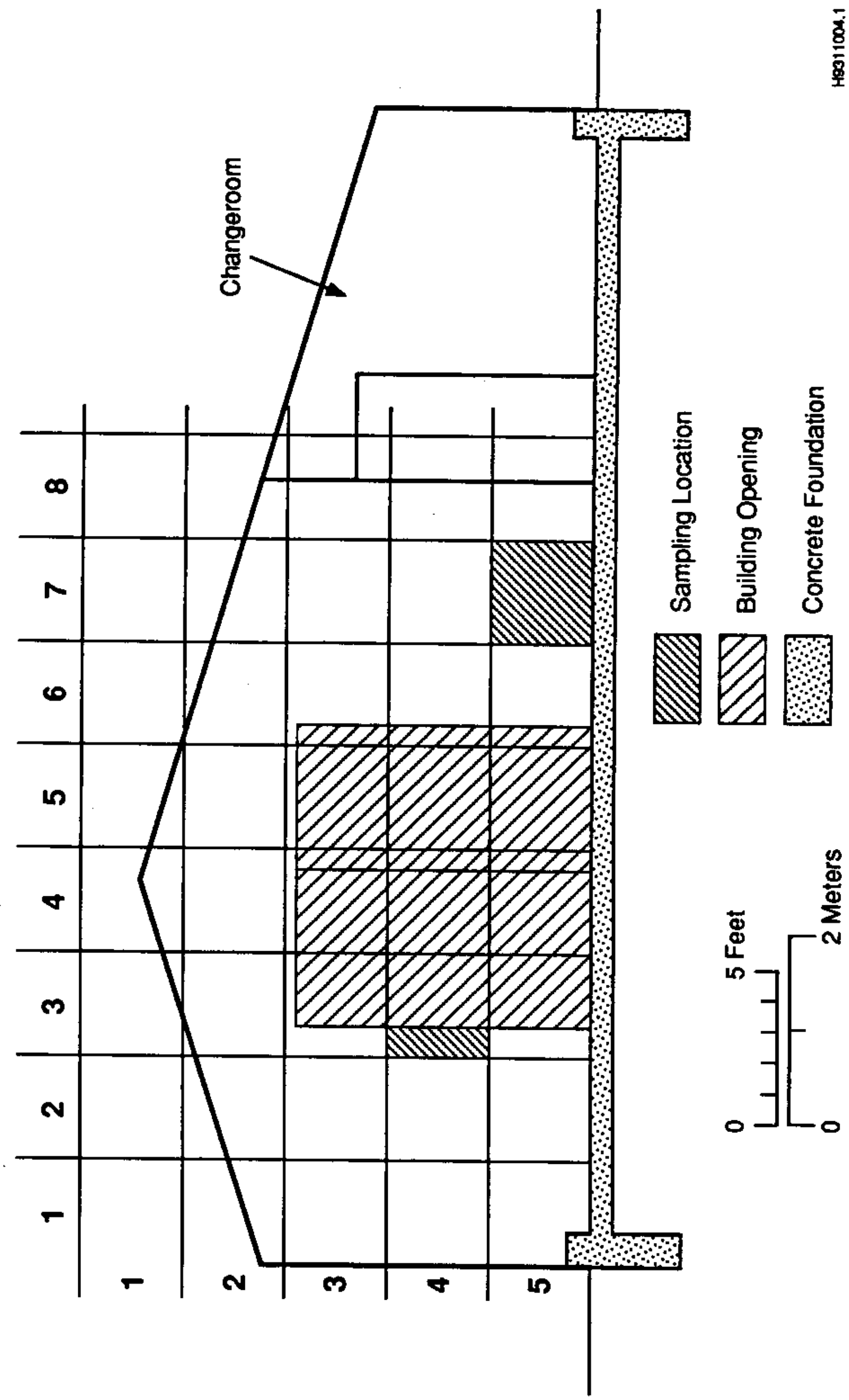
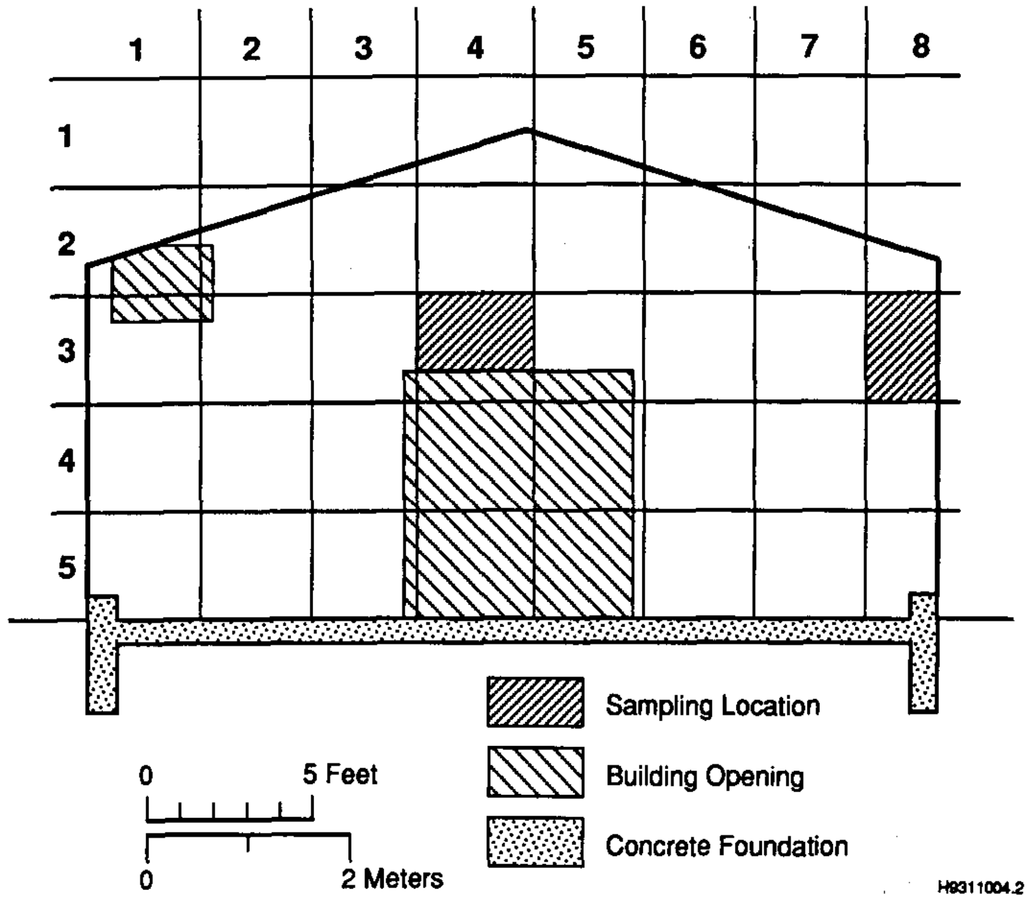
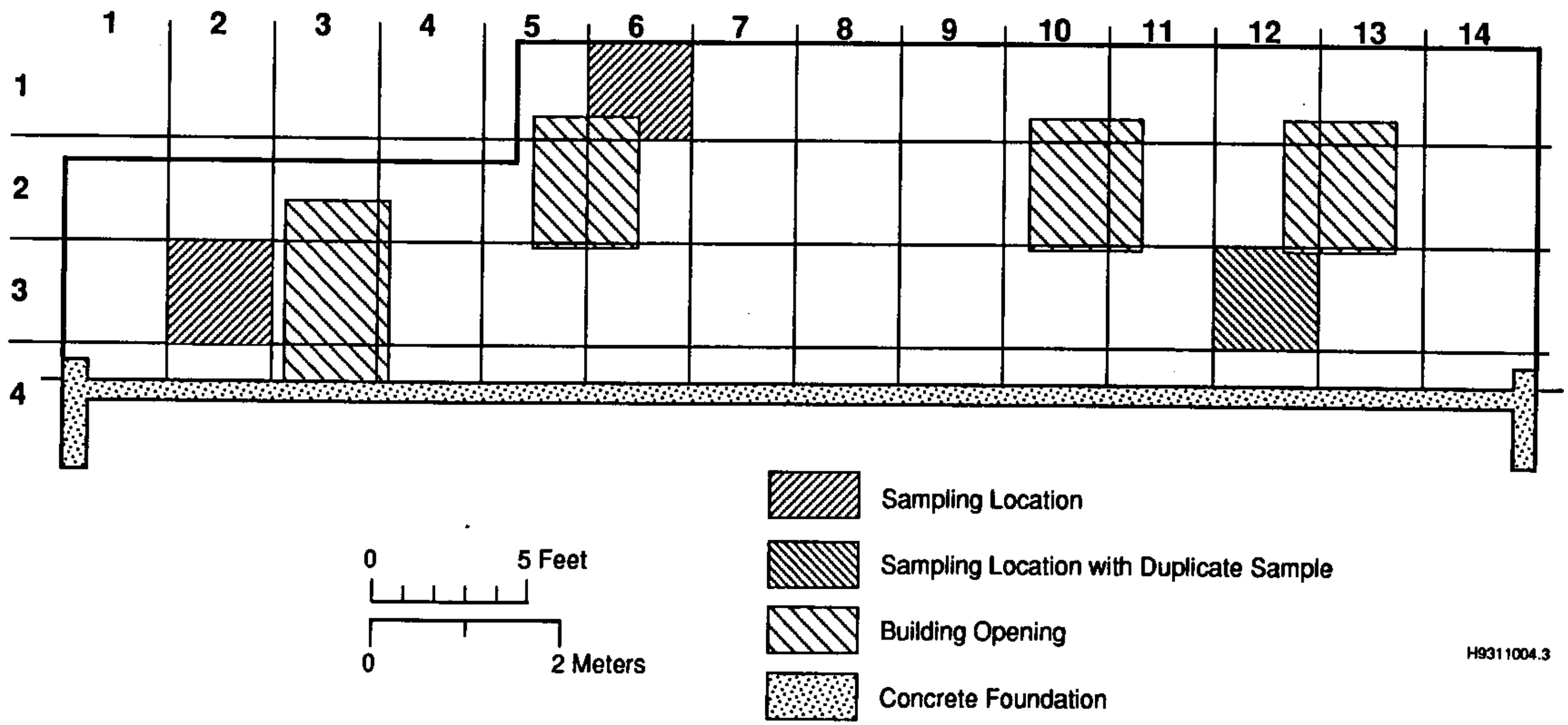


Figure 7. 304 Concretion Facility, South Wall Wipe Sample Locations.

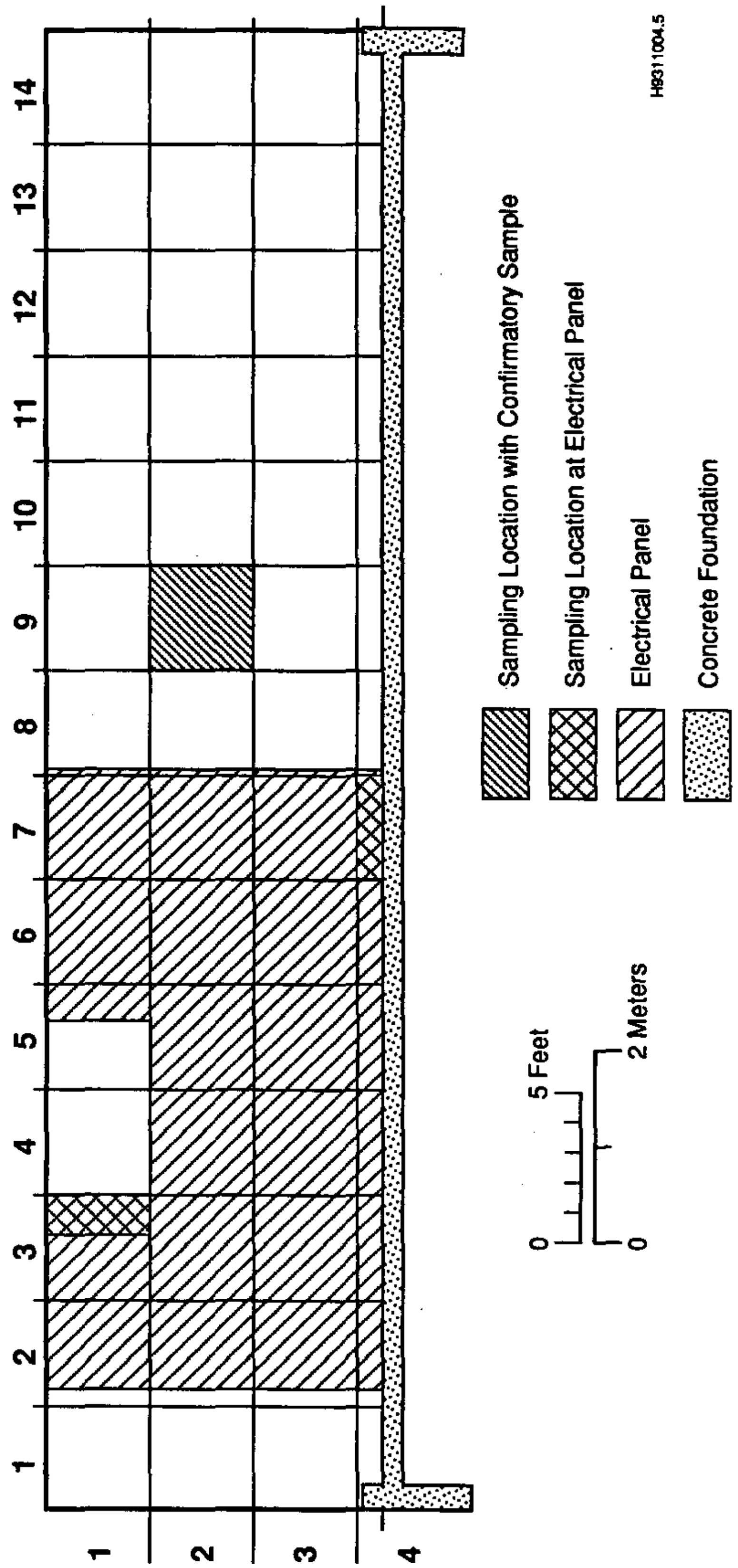


9 1 3 3 0 4 . 1 4 2 8

Figure 8. 304 Concretion Facility, East Wall Wipe Sample Locations.



1 Figure 9. 304 Concretion Facility, West Wall Wipe Sample Locations.



5.2 CONCRETE CORE SAMPLING

Concrete core samples will be collected at a total of 12 locations. Samples for inorganics analysis will be collected at all 12 locations with VOA samples being collected at only 6 of the 12 locations. The sampling locations for concrete core samples are shown in Figures 2, 3, and 4. Concrete core organic and inorganic samples will be collected from the following locations:

- In the sump (Figure 2)
- In the trench (Figure 2)
- On top of the crack near the south wall (Figure 2)
- Next to the floor drain (Figure 2)
- From the building floor sampling grid 11 south by 4 west (Figure 3)
- From the outside storage pad sampling grid 4 south by 6 west (Figure 4).

The remainder of the samples are concrete core inorganic samples that will be collected from the building floor sampling grid locations shown in Figure 3.

The recommended core size is 4 inches. Other core sizes may be used to meet sampling conditions. The cores will be taken from the center area of each sampling grid. Separate cores will be collected for inorganics analysis and VOA. The cores will be taken in a manner that minimizes any overlap with other core samples.

The appropriate containers and lids (i.e., compatible) will be used for the concrete core VOA samples. Sealable plastic bags may also be used if the concrete cores cannot fit into a jar-type container. The type of container used will be recorded in the field logbook.

There is no SW-846 method for collecting samples from concrete. The sampling method or technique used will be identified and recorded in the field logbook. The water used in coring will be vacuumed and containerized to minimize cross-contamination and displacement of volatiles.

5.3 CONCRETE CHIP SAMPLING

Concrete chip samples will be collected at one location for inorganics analysis. The sampling location for the concrete chip sample is shown in Figure 5. The chips will be collected from the center of the sampling grid to a depth of approximately 3/8 inch. The appropriate containers and lids (i.e., compatible) will be used for the concrete chip samples.

There is no SW-846 method for collecting chip samples from concrete. The sampling method or technique used will be identified and recorded in the field logbook.

5.4 SOIL SAMPLING

Soil samples will be collected at a total of nine locations for VOA and inorganics analysis. Four of the samples are co-located with the authoritative concrete core samples taken from the floor of the facility, as shown in Figure 2. Two of the soil sample locations are located on the storage pad, as shown in Figure 2, with one each being taken by coring through the concrete at the north and south expansion joints. The remaining three soil samples are co-located with the asphalt samples from the east and west sides of the building (Section 5.6). The appropriate containers and lids (i.e., compatible) will be used for the soil VOA samples.

Most of the samples will be collected through the holes that result from the concrete and asphalt coring operations. The concrete sampling is expected to leave several holes in the concrete. A hole or holes specifically for soil sampling will need to be drilled through the concrete at the expansion joints shown in Figure 2. The Sampling Field Team Leader will determine the number of holes that need to be drilled to collect the soil samples at the expansion joints.

When possible, a different concrete core hole will be used for each level and type (VOA or inorganic) of soil sample. The samples will be collected at intervals of 0 to 6 inches, 6 to 18 inches, and 18 to 24 inches. At each interval, one VOA sample and one inorganic analysis sample will be collected. Hand tools will be used to collect the soil samples.

5.4.1 Additional Requirements for the Collection of VOA Soil Samples

No deviations are permitted from the requirements of this section. The VOA soil samples will be collected as soon as possible after the concrete core samples have been collected. Volatile organic analysis soil samples will be collected the same day that the concrete cores are drilled. At any given sampling interval, the VOA soil sample will be collected before the inorganics sample. The VOA samples will be collected so that there is minimum or no headspace in the containers. Mixing or homogenizing of the material comprising the VOA sample is not allowed.

5.5 WIPE SAMPLING

Wipe samples will be collected at a total of 11 locations (10 wall and 1 girder) for inorganics analysis. Figures 6, 7, 8, and 9 show the locations of the 10 wall samples for inorganics analysis. The one girder wipe sample is to be collected from the top of one girder directly above the area where the concretion process was located and where the fire occurred. As viewed from Figure 2, the boundaries of this area are defined as follows:

- north boundary - an east-west line at the floor drain
- east boundary - a north-south line 8 feet east of the building center line

- south boundary - an east-west line 10 feet from the south wall

- west boundary - a north-south line 8 feet west of the building center.

The specific girder will be chosen at the discretion of the Sampling Field Team Leader and identified in the field logbook.

5.5.1 Wipe Sampling Methodology

The general wipe sampling methodology presented in *A Compendium of Superfund Field Operations Methods* (EPA 1987) will be used. Wipe sampling of surfaces will be performed by wiping a 100-square-centimeter area using Whatman No. 42[1] filter paper or equivalent. The filter papers will be laboratory-prepared with toxicity characteristic leaching procedure (TCLP) extraction fluid number 2 and containerized in individual glass containers. The TCLP extraction fluid number 2 will be prepared as specified in Section 5.7.2 of SW-846 Method 1311. (Note: The TCLP extraction fluid is only being used as a solvent for wipe sampling. No TCLP analysis will be performed.)

The interior walls have been divided into 1-square-meter sample grids (Figures 6, 7, 8, and 9). One filter paper will be used to wipe the wall surface from a 100-square-centimeter section within each sample grid. The entire 100-square-centimeter area within a disposable template will be carefully covered, using vertical strokes, starting at one end and progressing to the other end (Figure 10). The filter paper will be held using clean gloves to prevent contamination. A new pair of gloves will be used for each wipe sample. Care will be taken to wipe the surface only once throughout the sampling effort.

The top of the one steel girder chosen for sampling will be wipe sampled using the same technique as described previously. One 100-square-centimeter area will be wipe sampled.

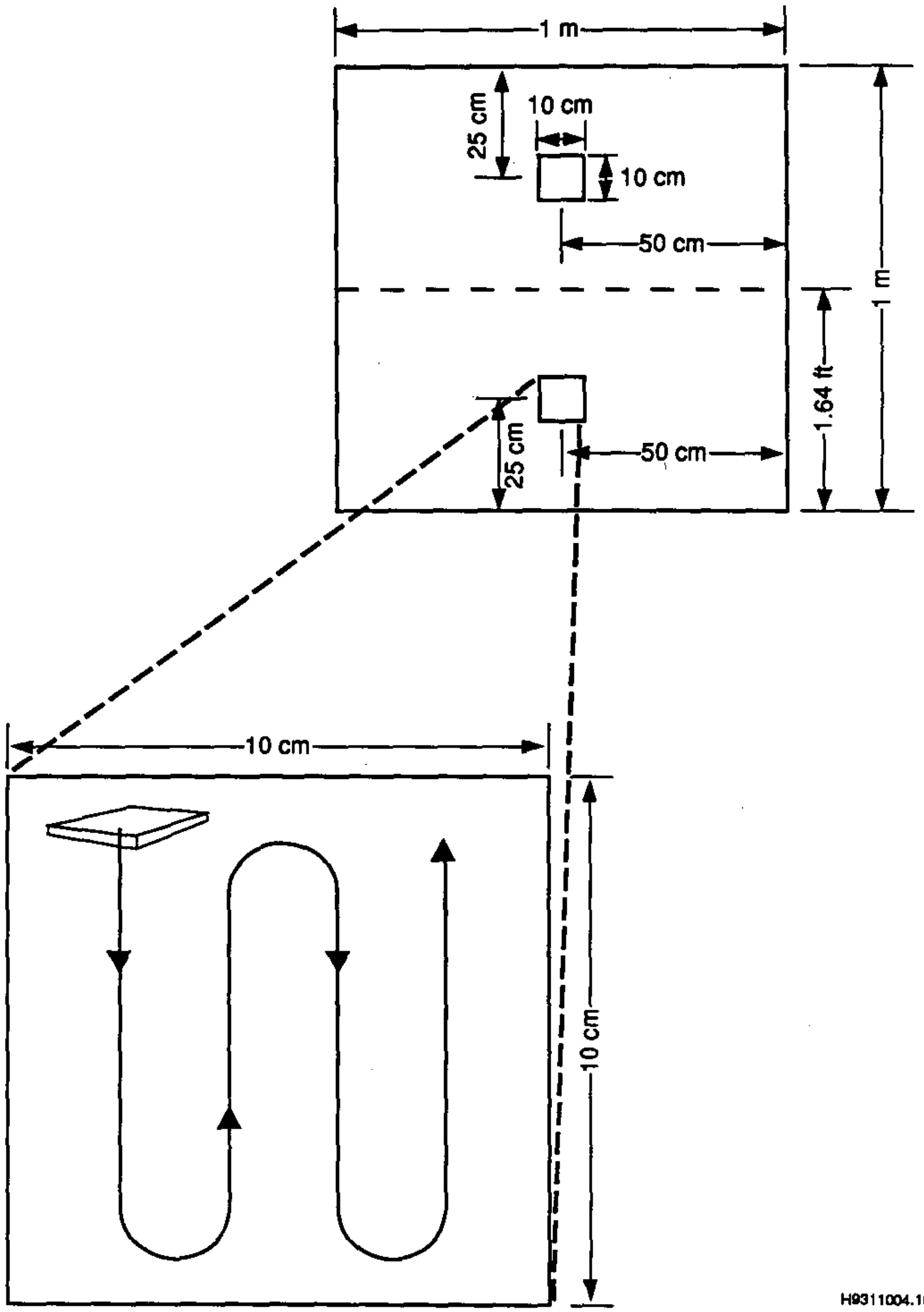
After the area is wiped, the filter paper will be folded with the exposed side in, and then folded over to form a 90-degree angle in the center of the filter. The filter then will be returned to the original glass container, angle first, and immediately sealed.

5.6 ASPHALT CORE SAMPLES

Asphalt core samples will be collected at a total of four locations for inorganics analysis. One asphalt core sample will be collected from a location on the outside storage pad (Figure 4). In addition, two asphalt core samples will be obtained from the west side of the 304 Building and one from the east side. The exact sampling locations will be determined at the time of sampling, and will be taken in places where contamination is most likely to have occurred (e.g., cracks, asphalt joints, visible stains). The specific locations will be chosen at the discretion of the Sampling Field Team Leader

[1]Whatman No. 42 is a trademark of Whatman, Incorporated.

1 Figure 10. Wipe Sampling Technique.



and identified in the field logbook. The recommended core size is 4 inches. Other core sizes may be used to meet sampling conditions. The cores will be taken in a manner that minimizes any overlap with other core samples. Sealable plastic bags may also be used if the asphalt cores cannot fit into a jar-type container.

There is no SW-846 method for collecting core samples from asphalt. The sampling method or technique used will be identified and recorded in the field logbook. The water used in coring will be vacuumed and containerized to minimize cross-contamination and displacement of volatiles.

6.0 QUALITY CONTROL SAMPLES

This section identifies the quality control samples for the sampling effort at the 304 Concretion Facility.

6.1 GENERAL INFORMATION

Field quality control samples will be collected by the sampling team and documented in the sampling logbook in accordance with EII 1.5, "Field Logbooks" (WHC 1988). Deionized water will be used for the field and equipment blanks because it provides the excellent sensitivity to contamination. Table 2 presents a summary of the quality control samples for the 304 Concretion Facility. While the number of samples is sufficient to determine if the 304 Facility can be clean-closed, there is not a sufficient number of samples for a detailed statistical analysis.

6.1.1 Duplicate Samples

Duplicate samples are included for each type of sample (concrete core inorganic, concrete core VOA, concrete chip, asphalt core, soil inorganic, soil VOA, and wipe). The purpose of the field duplicate samples is to indicate the precision of sampling and analysis.

Duplicate samples are collected from the same location and using the same methods or techniques as a regular sample, but placed in a separate container.

6.1.2 Equipment Blanks

Equipment blanks are included for each type of sample (concrete core inorganic, concrete core VOA, concrete chip, asphalt core, soil inorganic, soil VOA, and wipe). The purpose of the equipment blanks is to check for sampling device cleanliness from the laboratory decontamination efforts.

The equipment blanks for concrete core, concrete chip, asphalt core, and soil samples are collected using deionized water transported to the sampling site. At the site, the deionized water is poured over or through the sample collection device, collected, and returned for analysis.

Table 2. Summary of 304 Concretion Facility Routine and Quality Control Samples:

SAMPLE TYPES	Concrete Core[1]	Concrete Chip	Soil			Wipe[2]	Asphalt
NUMBER OF SAMPLE LOCATIONS	12	1	9			11	4
SAMPLING INTERVALS (depth in inches)	na	na	0 to 6	6 to 18	18 to 24	na	na
NUMBER OF SAMPLES							
Inorganic Analysis	12	1	9	9	9	11	4
Organic Analysis	6	na	9	9	9	na	na
DUPLICATE SAMPLES							
Inorganic Analysis	1	1	1	1	1	1	1
Organic Analysis	1	na	1	1	1	na	na
EQUIPMENT BLANK[4] (Inorganic Analysis)	V5	na	V5			1	V1
CONFIRMATORY WIPE SAMPLE (Inorganic Analysis)	na	na	na			1	na
FIELD BLANKS[5] (Inorganic Analysis)	V5	na	V5			V1	V3

NOTES:

[1]Includes both the 4 authoritative and the 8 random concrete core samples.

[2]Includes both the 10 random wipe samples and the 1 wipe sample from the girder.

[3]Includes both the 1 random asphalt sample and the 3 asphalt core samples.

[4]Frequency for each sample type: 1 per day of sampling and 1 after each time sampling equipment undergoes field decontamination.

[5]Frequency for each sample type: 1 per day of sampling or for each 20 samples collected.

na = not applicable.

V1 = Number of samples is variable; 1 expected, covering an estimated 1 day of sampling.

V3 = Number of samples is variable; 3 expected, covering an estimated 3 days of sampling.

V5 = Number of samples is variable; 5 expected, covering an estimated 5 days of sampling.

The equipment blanks for wipe samples consist of filter paper saturated with TCLP extraction fluid number 2. They remain sealed while in the field and are returned for analysis. Additional details are provided in Section 6.5.

6.1.3 Field Blanks

Field blanks will only be taken if field decontamination procedures are used. The purpose of the field blanks is to check the effectiveness of the field decontamination procedures to determine if there is contamination originating in the sampling environment.

Field blanks for any field decontaminated equipment are collected by pouring deionized water over or through the sampling device. Then the sample is returned for analysis.

Field blanks for the wipe samples will be collected by removing the filter paper (saturated with TCLP extraction fluid number 2) from the container. The filter paper is then exposed to air for the same amount of time required to collect a wipe sample, then returned to the original sample container.

6.1.4 Trip Blanks

Trip blanks will not be included for the VOA samples. The reasons for their exclusion are the following.

- Neither sand nor deionized water is a suitable medium for a trip blank for soil. Sand has little to no affinity for adsorbing volatile organics. Water absorbs organics, whereas soil primarily adsorbs organics; because the mechanism is different, water is not a suitable material for the trip blanks.

- The field and equipment blanks will 'trip' with the routine samples and will contain any volatile contamination that may be present.

6.2 CONCRETE CORE FIELD QUALITY CONTROL SAMPLES

The quality control requirements for concrete core samples are as follows.

- One duplicate concrete core sample will be collected for inorganic analysis. The sample will be collected from the random sample location shown in Figure 3.

- One duplicate concrete core sample will be collected for VOA. The sample will be collected from the random sample location shown in Figure 3.

- One equipment blank (deionized water) will be collected for inorganic analysis per day of sampling.

- If field decontamination procedures are used, one field blank will be collected after decontamination. One field blank (using deionized water) will be collected per day of sampling or for each 20 samples.

The cores will be collected as close to each other as possible.

6.3 CONCRETE CHIP FIELD QUALITY CONTROL SAMPLES

The quality control requirements for concrete chip samples are as follows.

- One duplicate concrete chip sample will be collected for inorganic analysis. The sample will be collected from the random sample grid location shown in Figure 5.

- One equipment blank (deionized water) will be collected for inorganic analysis per day of sampling.

- If field decontamination procedures are used, one field blank will be collected after decontamination. One field blank (using deionized water) will be collected per day of sampling.

6.4 SOIL FIELD QUALITY CONTROL SAMPLES

The quality control requirements for soil samples are as follows.

- Three duplicate soil samples will be collected for VOA. Duplicate soil samples will collected at 0 to 6-inch, 6 to 18-inch, and 18 to 24-inch intervals. The sample will be collected from the sump sampling location shown in Figure 2. This location was chosen because it has a greater potential for volatile organics contamination.

- Three duplicate soil samples will be collected for inorganic analysis. Duplicate soil samples will collected at 0 to 6-inch, 6 to 18-inch, and 18 to 24-inch intervals. Each duplicate sample will be collected on different sampling days. One of the samples will be collected from the floor drain sampling location shown in Figure 2. The other two samples will be collected from locations determined by the Sampling Field Team Leader and the locations recorded in the field logbook.

- One equipment blank (deionized water) will be collected for inorganic analysis per sampling day.

- If field decontamination procedures are used, one field blank will be collected after decontamination. One field blank (using deionized water) will be collected per day of sampling or for each 20 samples.

6.5 WIPE FIELD QUALITY CONTROL SAMPLES

The quality control requirements for wipe samples are as follows.

- One duplicate wipe sample will be collected for inorganic analysis. The duplicate will be collected from a 100-square-centimeter area adjacent to the original sample, i.e. within the 1-square-meter sample grid. The sample will be collected from the random sample grid location shown in Figure 8.

- One equipment blank (clean filter paper saturated with TCLP extraction fluid number 2) will be collected for inorganic analysis. This sample will remain sealed during the sampling event and the filter paper will not be handled in the field.

- One field blank (using clean filter paper saturated with TCLP extraction fluid number 2) will be collected per day of wipe sampling or for each 20 samples. The filter paper will be removed from the container (with the sampler wearing clean gloves) and exposed to air for the same amount of time required to collect a wipe sample.

In addition to the quality control samples listed, one confirmatory wipe sample will be collected. This sample will only be taken once during the sampling of the 304 Concretion Facility. The purpose of this sample is to determine if wipe samples are effective.

- One confirmatory wipe sample will be collected for inorganic analysis. The confirmatory sample will be collected from the same 100-square-centimeter area as the original wipe sample. The sample will be collected from the random sample grid location shown in Figure 9.

6.6 ASPHALT CORE FIELD QUALITY CONTROL SAMPLES

The quality control requirements for asphalt core samples are as follows.

- One duplicate asphalt core sample will be collected for inorganic analysis. The sample will be collected from the same sample location as the asphalt core sample collected on the outside east of the building (Section 5.6).

- One equipment blank (deionized water) will be collected for inorganic analysis per pay of sampling.

- If field decontamination procedures are used, one field blank will be collected after decontamination. One field blank (using deionized water) will be collected per day of sampling or for each 20 samples.

The cores will be collected as close to each other as possible.

7.0 LABORATORY ANALYSIS

Laboratory analysis will be performed on the samples to determine the concentration and, for wipe samples, the amount of the constituents of concern that remain at the 304 Facility after decontamination.

7.1 CONSTITUENTS OF CONCERN

The samples to be analyzed for inorganic constituents are as follows.

- concrete core inorganic samples
- soil inorganic samples
- asphalt samples
- concrete chip samples
- wipe samples.

The inorganic constituents of concern are as follows.

- Beryllium
- Cadmium
- Chromium
- Lead
- Nickel
- Uranium.

The samples to be analyzed for volatile organic constituents are as follows.

- concrete core organic samples
- soil organic samples.

The volatile organic constituents of concern are as follows.

- Trichloroethylene
- Tetrachloroethylene
- 1,1,1-Trichloroethane
- 1,1-Dichloroethylene
- cis-1,2-Dichloroethylene
- trans-1,2-Dichloroethylene
- Ethyl acetate
- Methyl ethyl ketone.

The analytical methods are identified in Section 7.5.

7.2 SAMPLE PREPARATION FOR CONCRETE CORE, CONCRETE CHIP, AND ASPHALT CORE INORGANIC SAMPLES

Before the concrete core, concrete chip, and asphalt core samples can be analyzed for inorganics, it may be necessary to crush or break-up the samples to reduce the size of the material sent for analysis. Size reduction may occur in either the field or the laboratory. If size reduction occurs in the field, the sample number, technique used for reduction, and any other pertinent or relevant information, will be documented in the field logbook.

7.3 SAMPLE PREPARATION FOR CONCRETE ORGANIC SAMPLES

The preparation of the concrete organic samples will be performed at the 222-S Analytical Laboratory. Before the concrete cores can be analyzed for volatile organics, additional laboratory preparation is required. Before analysis, the concrete core will be handled according to *Preparation of Concrete for Volatile Organics Analysis*, (WHC 1994). The resulting extractant from each sample will be analyzed at the 222-S Analytical Laboratory for volatile organics in accordance with Section 7.5.

7.4 SAMPLE PREPARATION FOR WIPE SAMPLES

Before the wipe samples can be analyzed for inorganics, additional laboratory preparation is required. Each wipe sample will be handled according to *Acid Digestion of Sediments, Sludges, and Soils*, SW-846 Method 3050 (EPA 1986). The resulting extractant from each sample will be analyzed for inorganics in accordance with Section 7.5.

7.5 ANALYTICAL METHODS

The SW-846 analytical methods (EPA 1986) will be used for the sample analysis, except for uranium. The uranium results will be determined by SCINTREX UA-2 laser method[2], Eastern Environmental Radiation Facility Method 00.07 (EPA 1984) or Laser Kinetic Phosphorimetric Analysis. The inorganics analysis methods are as follows:

- Method 6010, Inductively coupled plasma-atomic emission spectroscopy (analysis will be for the target analyte list. Except for lead, this list includes the inorganic constituents of concern listed in Section 6.1) (This method addresses the following constituents of concern: beryllium, cadmium, chromium, and nickel.)

- Method 7421, Lead (Atomic Absorption, Furnace Technique). (This method addresses the following constituent of concern: lead.)

- SCINTREX UA-2 laser method, EERF Method 00.07, or Laser Kinetic Phosphorimetric Analysis. (This method addresses the following constituent of concern: uranium.)

[2]SCINTREX is a trademark of SCINTREX, Incorporated.

The VOA methods are as follows:

- Method 8260, Volatile organic compounds by gas chromatograph/mass spectroscopy capillary column technique. (This method addresses the following constituents of concern: trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, and ethyl acetate. Ethyl acetate is not included as a target analyte in the most current revision (Revision 0, July 1992) of Method 8260. However, ethyl acetate can be identified by Method 8260 as a tentatively identified compound. If ethyl acetate is found in an estimated concentration approaching the clean-up level, further sampling and quantitative analysis will be performed if directed by Ecology.)

- Method 8240, Volatile organics by gas chromatography/mass spectrometry. (This method addresses the following constituent of concern: methyl ethyl ketone.)

7.6 DATA REQUIREMENTS FOR THE ANALYTICAL LABORATORIES

The 222-S Laboratory is required to record and provide sufficient data in the performance of any preparation and analysis of the concrete VOA samples to support the data validation described in Section 8.0. The contract laboratory is required to supply stand-alone data packages to support full data validation.

7.7 BATCHING OF INORGANIC SAMPLES

The inorganic samples will be batched for analysis, providing holding times are not violated. The inorganic samples consist of 12 concrete core inorganic, 27 soil inorganic, 11 wipe, 1 concrete chip, and 4 asphalt core samples and the associated quality control samples. The concrete core organic and soil organic samples will not be batched.

8.0 DATA VALIDATION

Data validation will be conducted to Level D as defined in the *Data Validation Procedures For Radiological Analysis* (WHC 1993a) and *Data Validation Procedures For Chemical Analyses* (WHC 1993b), as appropriate. Level D validation consists of the following:

- verification of required deliverables

- verification of requested versus reported analyses

- verification of transcription errors

- evaluation and qualification of results based on analytical holding times
- matrix spikes
- laboratory control samples (radiological samples only)
- laboratory duplicates
- analytical method blanks
- chemical recoveries
- tracer recoveries
- surrogate recoveries
- initial and continuing instrument calibrations
- quench monitoring
- counting instrument resolution checks
- calculation checks.

There will be 100 percent validation of the data because of the small size of the sample set and that similar types of samples (e.g., all wipe samples) can be batch analyzed at the analytical laboratory.

9.0 REFERENCES

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 USC 9601 et seq.

DOE-RL, 1993a, *304 Concretion Facility Closure Plan*, DOE/RL-90-03, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 1993b, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-92-24, Rev. 1, U. S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 1984, *Eastern Environmental Radiation Facility Radiochemistry Procedures Manual*, 520/5-84/006, U.S. Environmental Protection Agency/Eastern Environmental Radiation Facility, Montgomery, Alabama.

EPA, 1986, as amended, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, 3rd Edition, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1987, *A Compendium of Superfund Field Operations Methods*, EPA/540/P-87/001, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C.

Resource Conservation and Recovery Act of 1976, 42 USC 6901 et seq.

WAC 173-303, "The Dangerous Waste Regulations," *Washington Administrative Code*, as amended.

WAC 173-340, "The Model Toxics Control Act Cleanup Regulations," *Washington Administrative Code*, as amended.

WHC, 1988, *Environmental Investigations and Site Characterization Manual*, WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.

WHC, 1993a, *Data Validation Procedures For Radiological Analysis*, WHC-SD-EN-SPA-001, Westinghouse Hanford Company, Richland, Washington.

WHC, 1993b, *Data Validation Procedures For Chemical Analysis*, WHC-SD-EN-SPA-002, Westinghouse Hanford Company, Richland, Washington.

WHC, 1994, *Preparation of Concrete for Volatile Organics Analysis*, LA-523-435, Westinghouse Hanford Company, Richland, Washington.

METRIC CONVERSION CHART

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

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